

Ch. 29 Potential and Field  
P. 2, 4, 35  
C. 1

29.P.2

Potential Difference

$$y_0 = -5 \text{ cm} \quad y_1 = 5 \text{ cm}$$

$$\vec{E} = 20,000 \hat{i} - 50,000 \hat{j} \text{ V/m}$$

$$\begin{aligned} \Delta V &= - \int \vec{E} \cdot d\vec{s} \\ &= - \int_{-5}^5 -50,000 dy \end{aligned}$$

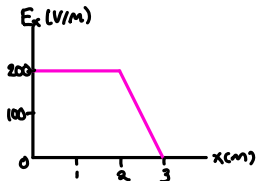
$$\Delta V = 5,000 \text{ V}$$

$$= -(-500,000 \text{ V/m})$$

$$\Delta V = 500,000 \text{ V/cm}$$

$$\Delta V = 5,000 \text{ V/m}$$

29.P.4



$$V_0 = -50 \text{ V}$$

$$V_3 = -550 \text{ V}$$

$$V(x=3 \text{ cm}) = -550 \text{ V}$$

$$\begin{aligned} V_0 + V_3 &= -50 \text{ V} - 500 \text{ V} \\ &= -550 \text{ V} \end{aligned}$$

$$\begin{aligned} A &= 2(200) + \frac{1}{2}(1)(200) \\ &= 400 + 100 \end{aligned}$$

$$A = 500 \quad \vec{E} \cdot d\vec{s} = 500$$

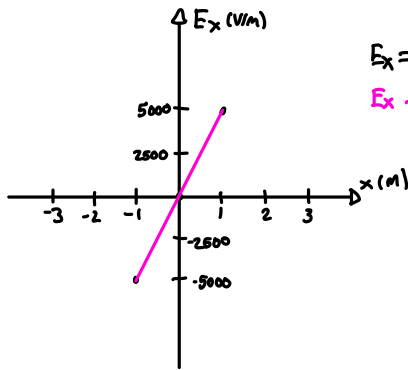
$$\Delta V = - \int \vec{E} \cdot d\vec{s}$$

$$\Delta V = -500 \text{ V}$$

29.P.35

$$E_x = 5000x \text{ V/m}$$

a.



$$E_x = 5000x$$

$$E_x - 1 \text{ m} \leq x \leq 1 \text{ m}$$

b.

$$\Delta V = - \int \vec{E} \cdot d\vec{s}$$

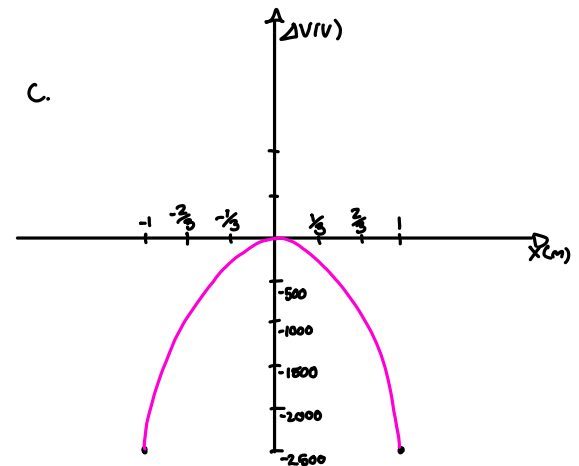
$$\vec{E}_x = 5000x \text{ V/m}$$

$$\begin{aligned} \Delta V &= - \int 5000x dx \\ &= - (2500x^2) \end{aligned}$$

$$\Delta V = -2500x^2$$

$$\Delta V = -2500x^2$$

c.

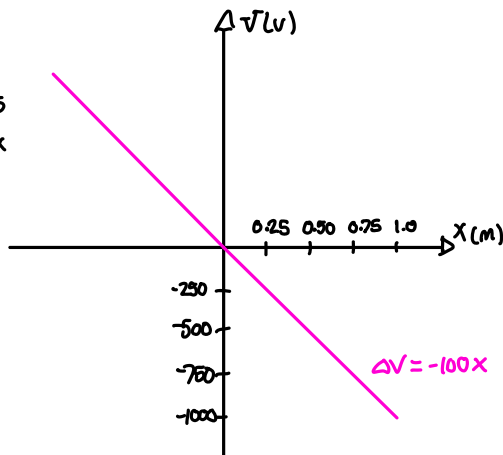


conceptual

29.C.1

$$\begin{aligned} \Delta V &= - \int \vec{E} \cdot d\vec{s} \\ &= - \int 100 dx \\ &= - (100x) \end{aligned}$$

$$\Delta V = -100x$$



$$\Delta V = -100x$$